A SIMPLE MONITORING TOOL FOR LOCAL COMMUNITY USE IN BWNDI'S MULTIPLE USE ZONES, S.W UGANDA

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June 2014

Acronyms

ITFC	Institute of Tropical Forest Conservation
BMCT	Bwindi Mgahinga Conservation Trust
UWA	Uganda Wildlife Authority
MUZs	Multiple Use Zones
MUP	Multiple Use Programme
MU	Multiple Use
IRU	Integrated Resource Use
RUCs	Resource Use Committees
RUs	Resource Users
NGOs	Non-Governmental Organizations
BINP	Bwindi Impenetrable National Park
WCC	Warden Community Conservation
WRM	Warden Research and Monitoring
CCRs	Community Conservation Rangers
MRR	Monitoring and Research Ranger
LCMG	Local Community Monitoring Group
RO	Research Officer
HT	Herbarium Technician
RV	Research Volunteer
IGCP	International Gorilla Conservation Programme
CTPH	Conservation Through Public Health
REPA	Rights, Equity and Protected areas Program
PRA	Participatory Rural Appraisal
PA	Protected Area
MoU	Memorandum of Understanding
PSPs	Permanent Sample Plots
SACCOs	Savings and Credit Cooperative Organisations
GPS	Geographic Positioning System
UCOTA	Uganda Community Tourism Association
CPIs	Community Protected area Institutions
CSOs	Civil Society Organisations

I. Acknowledgements

II. Executive summary

A simple tool for monitoring the status of multiple use zones by local people in Bwindi Impenetrable National Park was developed by the Institute of Tropical Forest Conservation (ITFC) together with the Uganda Wildlife Authority (UWA) with funds from the Bwindi Mgahinga Conservation Trust (BMCT). This tool is aimed at bringing on board resource users in monitoring plant resource harvest impacts in the multiple use zones of Bwindi in order to engage and empower them in both data collection and analysis as a bottom-up approach. Seven resource use forest society members from the parishes of Karangara, Rutugunda, Southern ward, Mushanje, Nyamabare, Kashasha Muramba and Buremba were involved in developing the monitoring tool. Participatory approaches that involved face-to-face interviews, participatory rural appraisals (PRAs) and forest visits were used as methods for data collection.

From the interviews and PRAs, we found out that the current forest off-take monitoring system has a number of strengths and weaknesses. The strength include that both UWA staff and resource users have been adhering to the collaborative management agreement which clearly sets the objectives, roles, rights, benefits and responsibilities for all stakeholders involved in the collaborative use and management. More specifically, UWA staff and resource use committees have ensured that resource users have proper identification cards and that the nominated resource users exhibit high standards of behaviour within the national park. They have also developed and maintained good relationships between members of the resource users and the national park staff. On the other hand, the main weaknesses mentioned include; failure by park staff to give feedback to resource users when they record the annual off-takes every harvesting season, refusal

by park managers to increase on the harvest quotas in response to the numerous requests made by the resource users and the failure by park staff to issue identification cards to resource users.

In all the parishes, the resource users were eager to participate in monitoring the status of Multiple Use Zones (MUZ) using a simple tool based on their forest experience and traditional knowledge.

Forest visits for trying out the new monitoring scheme were carried out in selected four parishes of Mpungu, Karangara, Rutugunda and Southernward. During field trials, the resource users agreed to monitor changes in availability of potentially harvestable forest resources as a simple indicator of the status of resources in Bwindi's MUZs. We also developed a simple checklist for monitoring ecological disturbance in MUZs such as fire signs, cutting of poles and presence of large mammals. Monitoring by local people will be done by a group of five resource users before the start of each harvesting season. The local community monitoring group will be composed of the Resource Use Committee (RUC) chairperson, RUC secretary, a representative of basket makers, a representative of herbalists and a representative of the Batwa (where applicable). Park staff (mainly the CCRs) will participate in this monitoring as observers only

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1.0 Introduction

Multiple Use (MU) also sometimes referred to as Integrated Resource Use (IRU) is a collaborative forest management arrangement between local people and Bwindi's park management. The program allows local people access non-timber forest products such as medicinal and basketry plants from the forest while at the same time assisting park management by reporting illegal activities when observed. In Bwindi Impenetrable National Park (BINP), the program started in 1994 as a pilot scheme in three parishes of Mpungu, Nteko and Rutugunda and now covers 13 other parishes. Nteko a former multiple use zone was later zoned for only tourism use (Bitariho *et al.,* 2006).

The term "multiple use" initially had a meaning of multiple land-uses at BINP of biodiversity conservation, tourism and low impact forest resource use. It later evolved to only low impact forest resource use (Wild, 2001). Under this programme, local people were allowed to access weaving and medicinal plants from Bwindi Impenetrable forest. Local people were also allowed to carry out beekeeping at the park periphery in the south-eastern part of Bwindi Park (Wild and Mutebi, 1996; ITFC, 1999; Wild, 2001).

The MU activities are restricted to only 20% of BINP at the park periphery in areas called Multiple Use Zones (MUZs) (Wild, 2001; Bitariho *et al.,* 2006). The Multiple Use Program (MUP) was set up on the premise that when local people access the forest for NTFPs, the park management/local people relationships will greatly improve. While the local people access the forest for livelihoods, park management benefits by the local people assisting in monitoring the forest parts used for

resource access through reporting illegal activities such as poaching and pitsawing when observed (Cunningham, 1992; Multiple use MoUs, 1994; Wild, 2001). This is a collaborative forest management type of arrangement.

Monitoring of plant harvest impacts is an integral part of determining sustainability of the harvested forest plants and therefore the MUP. It is generally accepted that sustainable harvest of plant resources may be determined though the plant's annual biomass production, recruitment and mortality rates studies or through plant population matrix models (Godoy and Bawa, 1993; Hall and Bawa, 1993; Peters, 1994; Shiel *et al.,* 1995; Bitariho *et al.,* 2006). These are long term studies and involve setting up of permanent sample plots (PSPs) and technical data analysis by specialist biologists.

Plant harvest impacts monitoring in BINP did not take place until 2001. The Institute of Tropical Forest Conservation (ITFC) set up PSPs in 2001 in MUZs and non-MUZs. Three highly used/demanded plants of *Rytigynia kigeziensis*, *Ocotea usambarensis* and *Loeseneriella apocynoides* are being studied in the PSPs (Bitariho *et al.,* 2006; Ndangalasi, Bitariho & Dovie, 2007). The PSPs provide data on the annual biomass production of harvested plants and population dynamics matrix models of the plants. The purpose of selecting the different sites of PSPs (MUZ and non-MUZs) is to compare the ecological behavior of the selected plants under different conditions outlined above and therefore be able to detect the impact of harvesting such plants.

To compliment the ITFC PSPs for harvested plant monitoring, UWA set-up a system of recording harvested plant off-takes by local resource users through the resource user committees called forest societies. Data on forest off-takes is recorded by the chairman of the forest society after each harvest season. Information recorded include, date of collection, name of collector, harvested plant name, amount harvested, time taken and any illegal activity observed.

Forest society records describe methods for quick assessment of the abundance and distribution of the resource plants. Time taken to harvest a plant resource for example is assumed to provide a quick clue on the abundance of the resource. Longer hours taken to harvest a resource plant than was previously would indicate that the plant is experiencing over-harvesting (Bitariho *et al.,* 2001). Also the amount of harvested plant material (got from offtake records) is compared with the amount the plant produces annually (got from PSPs data). Therefore both the PSPs data and the off-takes data are essential in determining harvested plant sustainability in Bwindi (Peters, 1994; Cunningham, 2001; Bitariho *et al.,* 2006).

2.0 Problem statement

Determining sustainable plant resource harvest involves long term studies (over 5 years) for determining harvested plant yields, mortality rates, recruitment rates and population matrix models (Hall & Bawa, 1993, Godoy & Bawa, 1993, Peters, 1994; Sheil *et al.,* 2005; Ticktin, 2004). Yet in most cases protected area managers need quick answers from researchers on the impacts of the MUP and plant harvesting. The ITFC's PSPs based monitoring system has been criticized for being too technical and that it takes long to see results for incorporation in reviewing annual plant harvest quotas for local communities (e.g. Davey *et al.,* 2001). The local community

offtake recording system has weaknesses in that sometimes resource users do not record harvested plant off-takes. It is also difficult to record the medicinal plants that are harvested daily when needed as opposed to the seasonal harvest of the basket weaving plants (Bitariho *et al.,* 2004b). Whereas the scientific methods pointed above are very useful in providing information from monitoring the sustainability of plant resource harvest, the methods do not engage the local people involved in the plant resource harvests and the harvesters get to know about the impacts from the park authorities (top-down approach).

Presently the forest societies are no longer active like in the past and some resource users interviewed have mentioned that they no longer hold meetings (Bitariho *et al.,* 2004b). To compound this problem, Bwindi's park management seems not to analyze the plant offtake data and take the feedback to the local forest societies. There are no incentives or motivation for resource users to record plant off-takes and park management to analyze and take back feedbacks like was in the past. There is a dire need of plant resource monitoring methods that are simple to use and therefore easy to engage the local people in both data collection and analysis in a bottom-up approach. This method could compliment the technical methods pointed above. Indeed Bitariho (2013) recommended a need for such a tool that engages the local people in plant resource harvests.

3.0 Study justification

The present thinking of most researchers and park managers is in favour of involving local people in the management of natural resources (Castro & Nielsen, 2001; Dietz, Ostrom & Stern, 2003; Sheil and Lawrence, 2004; Garcia and Lescuyer, 2008). Many tropical countries have thus developed

mechanisms of integrating the participation of rural people in park management systems such as natural resource monitoring (Sheil and Lawrence, 2004;Garcia and Lescuyer, 2008). In most case studies, most of the participatory park management and monitoring systems are to a great extent driven by external factors such as donors and have minimal impact at the local level. This is evidenced by the fact that when funds from donors cease, the systems become dysfunctional (Garcia and Lescuyer, 2008).

The Bwindi's multiple use monitoring programme is a case in point. ITFC's PSPs for monitoring harvested plant resources were established in 2001 under an Ecological Monitoring Programme (EMP) funded by the Royal Netherlands Government through the Bwindi Mgahinga Conservation Trust. When this funding ended in 2004, the plant resource impact monitoring stopped. This was later revived in 2006 when ITFC got funds from other donors such as the USAID and MacArthur foundation that also later ceased the funding. So presently the plant resource monitoring activity is not longer taking place in Bwindi.

The BINP's local community plant offtake monitoring system was greatly initiated and funded by CARE's-Development through conservation (DTC) with technical assistance from ITFC to UWA (Bitariho *et al.,* 2004b). The DTC programme facilitated the plant offtake recording by training the forest society members and UWA staff in recording and analyzing the data. It also facilitated UWA staff with allowances while in the field monitoring the offtake records (Mugyerwa Benon-former community conservation warden *personal communications*). This was during the existence of the CARE-DTC project from 1994 to 2001.

Several authors have pointed out that the successful implementation of a local monitoring system should be the one that reinforces the roles of local communities as managers and co-managers of natural resources by giving due importance to their traditional knowledge (Davey *et al.,* 2001; Sheil and Lawrence, 2004; Fraser *et al.,* 2006; Lawrence *et al.,* 2006; Bonis-Charancle *et al.,* 2007; Garcia and Lescuyer, 2008). One of the reasons for the weakness of the local community monitoring system in BINP is the importance attached to ecosystem variables by donor agencies and UWA while the local people are mainly interested in the socio-economic impacts resulting from the management of the ecosystem (Balint 2006; Yuan *et al.,* 2003; Garcia and Lescuyer, 2008). The local people would like to see incentives obvious to them from the monitoring system (Garcia and Lescuyer, 2008; Douglas Shiel *personal communications*). There is therefore a need to involve local communities in the initiation, designing and implementation of a simple monitoring system for the BINP's MUP in a participatory manner.

This monitoring tool compliments other monitoring systems already set up by UWA and therefore complements other efforts set up to effectively involve the local people and offset the weaknesses pointed out above. The monitoring tool developed and presented herein is participatory and involves local communities and park managers, key stakeholders in the multiple use program.

4.0 Study objectives

The major goal of this study was to develop a simple and participatory plant harvest monitoring tool that supports the present ecological monitoring of the status of forest resources in BINP. The other specific objectives were to:-

i)   Assess strengths and weaknesses of the current local community plant offtake monitoring system

ii)   Determine how local people (resource users) and park managers could be motivated to fully participate in forest resource offtake monitoring system

iii)   Determine local people and park managers' views on how to improve the current plant offtake recording in Bwindi

iv)   Recommend a simple local community forest resource monitoring tool to be used by resource users in the multiple use zones

5.0 Methods

5.1 Interviews

Face-to-face interviews were carried out with Resource Use Committee (RUC) members and park staff using a semi-structured questionnaire (see appendix for questionnaire). We interviewed the RUC members from Karangara, Rutugunda, Southern ward, Mpungu sub county- (Muramba, Buremba) Mushanje, Nyamabare and Kashasha parishes. The park managers interviewed were Community Conservation Warden (CCW), Research and Monitoring Warden (R&MW) and Community Conservation Rangers from BINP. A total of 20 RUC members from the plant harvest zones mentioned above were interviewed while a total of seven UWA staff were interviewed). The interviews conducted had open-ended questions and free ranging questions on plant resource offtake monitoring. Some of the questions asked included strengths and weaknesses of the current forest offtake monitoring system, forest offtake data analysis, what can be improved, how the forest offtake data is used and issues to do with motivation for forest offtake data recording and analysis.

5.2 Participatory Rural Appraisals

After the interviews above, we used participatory rural appraisals (PRAs) in the parishes of Karangara, Rutugunda, Southernward, Mpungu subcounty (Muramba, Buremba), Mushanje, Nyamabare and Kashasha to get local people's views and ideas on plant harvest monitoring in BINP. The community members were divided into two groups of Batwa and Bakiga in the parishes of Karangara, Rutugunda and Mpungu. The groups were met separately to ensure equal participation and avoid suppression of the marginalized community members such as Batwa and women. The PRA team comprised of the community conservation warden (CCW), warden research and monitoring (WR&M), community conservation rangers (CCRs) from BINP and research officer (RO), herbarium technician and research volunteer from ITFC.

Presentations from the CCW/CCRs were made on the objectives, roles and responsibilities of different stakeholders in the multiple use programme (Bitariho *et al.,* 2001). Specific emphasis was made on the role of forest resource users in the current plant harvest monitoring system. New roles and responsibilities applicable to the new local community plant monitoring system were also suggested.

The RO together with the WR&M presented to the local people the current UWA/local community plant harvest monitoring system. Key results from local community off-takes records were presented to the local people as a way of feedback. In particular the RO and WR&M highlighted successes, failures and problems of the current plant offtake recording system and the importance of recording off-takes.

The RO further presented to the forest resource user groups ITFC's two methods of plant abundance assessment used in BINP (a comparison of subjective focused searches and plot

methods). The two methods have been used in assessing plants to be harvested in Bwindi by local people and have shown not to differ in their assessments of the plants. Suggestions of a new plant harvest monitoring system based on the subjective focused searches and spearheaded by the local communities (forest societies) were also made.

The PRA team presented opportunities to the local people to respond to the presentations above. Every issue that participants mentioned was written on a flip chart to help participants visualize and reflect on the identified issues. Solutions and ideas for the development of a better system were thus sought from them. Local community members were allowed to ask questions, supplement and discuss the PRA team's presentations with a view to determining an acceptable monitoring system. An open ended discussion was encouraged to freely exchange views on the current multiple use programme and its problems (Bitariho *et al.,* 2001).

Photo 1: A PRA exercise in Nyamabare parish

6.0 Results/Findings

Using face-to-face interviews, we found out that the current forest off-take monitoring system has a number of strengths and weaknesses. All RUC members and most of the park staff (5 out of the 7) interviewed said that they were aware of and had participated in recording forest off-takes. However, all of the RUC members and a few park staff (2 out 7) said that they were not aware of and had not participated in the current system of monitoring plant harvest impacts using Permanent Sample Plots (PSPs) established by ITFC in the MUZs. More specifically, both park staff and RUC members mentioned the current system's strengths as;

- Resource users and CCRs were trained and know how to quantify and record off-takes

- Plant offtake data sheets used are simple to fill with the help of CCRs

- Resource users willingly declare their off-takes for recording

- RUCs are given copies of MoUs which have clear guidelines

- Park staff escort Resource users during harvesting sessions

- RUC members have a cordial relationship with park staff.

In addition, some strengths of the current monitoring system were mentioned by park staff alone and others by RUC members alone. **Those mentioned by park staff alone are:**

- Harvesting sessions are easy to supervise

- The system is flexible and allows herbalists to access park resources outside the season

- UWA and ITFC have competent staff to analyse off-take data

- The system has helped local communities to benefit from conservation

- The system has helped park in problem animal management, reporting illegal activities and putting out forest fires.

On the other hand, the strengths mentioned by RUC members alone are;

- Resource users report illegal activities in multiple use zones

- Resource users have village SACCOs where they get money to buy stationery etc

- RUCs that help in recording off-takes were democratically elected

- Resource users have regular meetings to prepare for harvesting and to resolve resource use conflicts.

Furthermore, the park staff and RUC members mentioned weaknesses/problems affecting the current system of monitoring plant harvest (see Table 1). From the weaknesses mentioned, it is

apparent that the current system suffers from systemic and structural problems which need to be addressed. As an example, park staff and RUC members pointed out that forest off-take data has not been analysed and as a result park managers have never taken feedback on off-takes to the resource users. This could be attributed to the fact that UWA's research and monitoring department which is responsible for doing such analyses has rarely been involved in the multiple use program. It is also important to note that the vitality of analyses and feedback on off-takes is not only for motivating resource users but it is also for keeping park managers informed about the status of PA resources in the multiple use zones.

The respondents also suggested a number solutions for addressing weaknesses in the current plant harvest monitoring system and these include; providing logistical and technical support to UWA's research and monitoring department, sharing off-take results among partners, reviewing the current monitoring system so that all stakeholders can participate more effectively and increasing harvest quotas as a way of motivating Resource users (see Table 2 for the suggested solutions).

Table 1: Weaknesses/problems of the current plant offtake recording system

a) **Park staff**
– Data analysis has not been done and therefore no feedback to resource users – The data has errors due to overestimation and underestimation of quantities harvested – Results of the plant harvest impact monitoring by ITFC have not been shared – There are data gaps in off-takes data for some parishes e.g. Mpungu (shows no harvests) – Herbalists have not been recording off-takes when they collect herbal medicines – R&M has not been involved in the current plant harvest impact monitoring activities – Poaching in the harvest zones is unexpectedly high – Resource users sometimes sneak into the park and access PA resources illegally – Resource users do not harvest enough quantities of the forest resources they want – Many Resource users are old and cannot go to harvest on their own but send their sons to replace them – Resource users want other resources not in the MoUs e.g. hoe-handles, fish and bamboo – Some resource users joined expecting other park benefits e.g. community enterprise projects

- Resource users do not come for resource harvest meetings because there are no incentives
- Resource users do not inform the CCRs in time when they want to go for harvesting
- Beekeepers want to harvest honey and plant resources when their cards are only for beekeeping
- Some leaders of RUCs are weak and this results in poor mobilization and conflicts

b) **RUC members**
– Park staff have not been giving feedback on off-takes data recorded by them
– Results of PSP assessments have not been shared with Resource users
– Resource users have requested for more PA resources from the park in vain
– Resource users fail to harvest sufficient quantities due to the time given to them to harvest (only twice a year leading to no or little harvests)
– The multiple use zones given for resource harvests are small (need to expand them)
– Some rangers mistreat resource users suspecting them to be poachers
– Some Resource users have not been trained in quantifying and recording off-takes
– Park does not facilitate the RUCs with books, pens and files for keeping off-take records
– Resource users struggle to find CCRs because CCRs live far from the RU communities
– RU meetings are poorly attended because RUCs have no money for mobilization
– Resource users lack field gear necessary for coping with the difficult forest conditions

Table 2: Views on how the weaknesses/problems can be addressed

a) **Park staff**
– ITFC should provide technical support to R&M for analyzing off-takes data
– Park should fund R&M to participate in plant harvest impact monitoring activities
– CCRs and RUC members should be re-trained in quantifying and recording off-takes
– Park should hold regular meetings with Resource users and inform them about the prevalence of illegal activities in the harvest zones so that the Resource users can become more vigilant
– Resource users should also be sensitized on the harvest quotas and why it is not allowable to harvest from ecologically sensitive areas e.g. gorilla habitats
– NGOs including BMCT, IGCP, CARE and CTPH should support on-farm cultivation as a long-term intervention for addressing the problem of the ever-increasing demand for park resources
– Weighing scales as opposed to simple estimation without any scientific equipment should be used to measure off-takes in kilos so as to minimize errors of overestimation and underestimation
– Parishes with weak RUCs should elect new and capable leaders
– Beekeepers who want to harvest plant resources as well as honey should be given dual user cards
– Park should link traditional herbalists and crafts makers with professional practitioners like UCOTA to enable them bargain better and earn more from their products
– The current system of monitoring the impact of harvesting park resources should be reviewed so that all stakeholders participate actively
– In reviewing MoUs, RUC members should be given an additional role of supervising harvests in the park when park has shortage of manpower
– Resource users who become inactive for a long time e.g. those who do not take part in

	harvesting and RU meetings for a year, should cease to be members and their ID cards should be withdrawn
b) RUC members	
	– Park should increase harvest quotas, expand harvest zones and allow more harvest days
	– Park should give regular feedback on plant offtake data analysis
	– ITFC should share PSP results
	– Park and partners should periodically train Resource users for effective monitoring of plant harvest impacts
	– Resource users should be allowed to periodically rotate in different harvest zones to allow for regeneration of park resources
	– Park should allow Resource users to harvest more plants offtakes when harvest quotas become insufficient and especially if the offtake data analysis show so
	– Researchers with experimental plots inside MUZs should inform RUCs whether they can harvest from the tagged plants
	– Rangers and Resource users should have regular meetings to address resource use conflicts
	– Park and partners should provide Resource users with rain-proof clothes, gumboots and gloves
	– Park should give Resource users uniforms to use when they are in the forest so that rangers can easily distinguish them from poachers
	– Park should involve Resource users in forest management activities like removing invasive species and maintaining the park boundary

6.1 How to improve plant off-take recording and analysis

From the interviews, it emerged that RUC members and park staff encounter many problems in recording and analysing plant off-takes data (Table 3). First, the resource users mentioned that they feel unappreciated by park despite the hard work they do in recording forest off-takes. They also face logistical challenges since they have no facilitation for transport, lunch and airtime on the days of harvesting when off-takes are recorded. On their part, park staff highlighted the problems of shortage of manpower, poor quality of data and late delivery of the data recorded. Of particular concern about data quality is that the forest off-take data has many gaps in some parishes and that local communities use different local names for the same plant. Park staff also said that they lack equipment to use in data collection e.g. GPS units and the R&M department has no funds to analyze and take back feedback as required. Some of the solutions to the afore-

mentioned problems include; rewarding the best data collectors, providing lunch and transport allowances for RUCs, organizing exchange visits among resource user groups, training and recruiting park staff, providing GPs units and motor cycles for CCRs and organising regular meetings (see Table 4 for more on the possible solutions).

Table 3: Views on the problems encountered during the current plant off-take recording/analysis

a) Park staff
– Park management has not prioritized analysis of off-takes data
– Park does not have data entry clerks who would assist with timely inputting of the data
– Resource users use different local names for the same plant and this is problematic during analysis
– Off-take data is often delivered late and sometimes the data is not submitted at all
– There are gaps in the off-take data which has so far been entered in the computer
– RUC members have often mixed up entries on the data sheets e.g. writing the name of the harvest zone instead of the resource harvested
– When it rains, Resource users disperse without recording
– There is a tendency by some Resource users to under-declare their off-takes thinking that if they declared all the off-takes park authorities would decrease harvest quotas
– CCRs do not have GPS units for recording location data of the area harvested
– There is limited facilitation for CCRs to deliver data since most of them lack motorcycles
– There is no facilitation for R&M to interface with Resource users during harvesting and recording off-takes
b) RUC members
– Resource users walk long distances looking for suitable sites for recording off-takes
– Resource users lack community halls where they can assemble for recording off-takes
– CCRs bring data sheets for recording off-takes quite late and sometimes they forget to bring them
– RUC members walk quite a distance to submit filled-in data sheets to the CCRs
– RUCs feel that park staff don't appreciate the hard work Resource users put into recording off-takes
– RUCs have to be present every day of harvesting to record off-takes which sometimes takes a full day's work yet they have no facilitation for lunch and transport

Table 4: Views on how the problems of current plant off-take recording/analysis can be solved

a) Park staff
– Park should recruit data entry clerks in research and monitoring department
– Park should recruit and train staff in community conservation department for analyzing data
– Resource users should be sensitized about the value of declaring all the off-takes and the criteria used by park to determine harvest quotas
– Park staff and Resource users should have regular meetings for giving feedback and

discussing how to improve the quality of offtake data collected
- NGOs and park should provide CCRs with GPS units
- NGOs and park should provide motorcycles for CCRs to deliver data and carry out other duties
- Community conservation department should design forms for tracking the data at the ranger outposts and at the park headquarters in Buhoma
- NGOs and park should give rewards to the best performing CCRs and RUC members who excel in collecting good quality data
- Park should facilitate R&M to interface with Resource users during harvesting and recording off-takes

b) RUC members
- Park and partners should build community halls where Resource users can assemble for recording off-takes and holding RU meetings
- Park should organize exchange visits as a way of propagating best practice among RU groups
- RUC members should be accorded greater respect and appreciation by all stakeholders
- Chairpersons and other RUC members who participate in recording off-takes should be facilitated with lunch and transport allowances on the days of harvesting
- CCRs should endeavour to collect data sheets from RUCs rather than waiting for the latter to bring them to the ranger outposts

6.2 How to Motivate RUC members and park staff

Four out of seven park staff interviewed said that they were motivated by their roles and responsibilities in the current system of resource harvesting. Those who did not feel motivated cited the problem of not involving R&M staff in MUP activities and the inactive resource users who seem to be uninterested in the program as reasons for their dissatisfaction with the current arrangement. When asked whether they were willing to continue participating in this program notwithstanding the lack of motivation, the two park staff members said that resource users should show more cause for having the multiple use program in Bwindi by participating more actively and stopping illegal activities. On the other hand, all the interviewed park staff members were of the view that harvesting resources is in itself motivation for the harvesters to participate in monitoring MUP plant harvest.

Asked what would motivate them as park staff to do analysis of off-takes more regularly, they mentioned a number of motivation needs including the need for developing management questions that should be answered using the data on off-takes and the frequency for doing such analyses, the need for involving park staff in ITFC's assessments as well as training park staff in data collection, analysis and report writing and the need for active participation and showing interest in the multiple use program by the resource users.

On the question of motivating RUCs to effectively fulfil their roles and responsibilities, park staff who were interviewed suggested that;

- RUCs should be motivated by giving them regular feedback on the offtake data
- increasing plant harvest quotas when the offtake data necessitates so
- Initiating more community enterprises for income generation
- Supporting resource users' SACCOs (VSLA)
- Park staff escorting resource users during harvesting
- Paying RUC chairpersons a motivation fee to hold and organise regular meetings including offtake recording
- Organizing and registering RU groups for improved marketing and giving them material support in form of uniforms. Suggested possible sources could be from conservation NGOs such as CARE, REPA, BMCT, IGCP and lodges benefiting from Bwindi's booming tourism.

On their part, RUC members said that they have never got feedback of the forest off-take recording. However, they feel motivated participating in the current system of plant harvest impact monitoring by the desire to let the park know that they are interested in the MU program since they have benefited much from PA resources and would like the program to continue. They are also motivated by the desire to assist UWA in conserving PA resources and that UWA would in turn allow increased harvest quotas and access to other PA resources e.g. hot springs, mud

fish, mushrooms, wild yams, bamboo and hoe-handles. In addition, RUC members suggested more issues which they would consider as motivation. These include park staff giving them a share of revenue sharing money; the park supporting their SACCOs (VSLA) and the park allowing them to harvest more resources since what they currently harvest is very little (see also Table 5).

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a) What motivates you as RUC members in monitoring plant harvest?
– We feel proud working with park staff and if we record off-takes well UWA may give us jobs
– Resource users elected us to serve them and we do not want to disappoint them
– Sensitization by park staff helped us to appreciate why we should be recording off-takes
– We also record off-takes so that we can have permits to sell our products in the local markets
– Park and NGOs have been involving us in meetings and workshops

b) What else would you consider as motivation?
– Park should give us jobs to work as UWA staff
– Park and NGOs should pay us monthly allowances since we assist park in monitoring PA resources
– Park and NGOs should give us money for lunch, transport and communication during harvesting seasons
– Park and NGOs should support our children in school as a way of appreciating our work
– Park and NGOs should give us bicycles to ease our work of mobilizing members for RU activities
– Park, NGOs and Resource users should give us annual presents/rewards to the best performers
– Parka and NGOs should buy for us uniforms e.g. caps, t-shirts, badges for all Resource users
– Park and NGOs should help us to market our products
– Park and the NGOs should organize for us learning workshops and seminars
– Park should allow us to harvest in more than one zone so that we can get sufficient off-takes

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6.3 How to use the plant off-take data

Majority of RUC members said that park managers benefit from the offtake data recording the most. They mentioned that the park managers mainly use the data for monitoring illegal activities and for controlling resource harvest in the multiple use zones. Nonetheless, the resource users also felt that recording off-takes helps them to gain recognition from park and other conservationists and to show that they are indeed complying with the memoranda of understanding which they signed with park managers. On the other hand, park staff said that both park and resource users benefit from recording off-takes. They said that off-takes data is not

only useful for monitoring the status of plants in the harvest zones but it is also important for addressing park-community conflicts since both parties are involved in monitoring PA resources.

Asked how they would like the off-takes results finally used, RUC members suggested a number of management options. **If the results show a declining status of harvested resources, Park managers;**

- Could reduce the frequency of harvesting
- Reduce harvest quotas of the declining harvest resource
- Suspend harvesting of the affected plants
- Gazette more harvest zones
- Expand existing harvest zones to include areas where the declining plants are abundant
- Allow resource users to harvest substitute plants.
- Alternate the harvest zones and use manipulation techniques to encourage recovery
- Promote on-farm adaptation in the community
- If the plant resource decline is so severe, no harvesting should be allowed.

If results show a healthy status of harvested resources, park managers should;

- Increase harvest quotas of the affected plants
- Allow resource users keep harvesting in the current zones
- Increase on the frequency of harvesting the plants
- Allow more days in a harvesting season and increase the number of resource users.

If the results show neither a declining nor a healthy status of harvested resources, park could;

- Maintain the status quo whereby the harvest quotas, harvest zones, number of resource users and harvesting seasons remain unchanged.

Responding to the same question of how they would like off-takes results finally used, park managers suggested similar management options to the ones pointed out by RUC members. But they also suggested that if the resources decline; resource users should be informed about the need for reducing quotas and studies carried out to investigate the cause of the decline.

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6.4 How to improve the current plant offtake data collection

Park staff and RUC members were also asked to suggest specific recommendations for improving the current system of recording plant off-takes. Key among the recommendations made by both parties is *the need to review and revise the monitoring system such that new and more agreeable harvesting regimes, quotas and tools are developed in a participatory manner*.

Below are the specific recommendations made by both park staff and RUC members;

How can resource users be motivated and empowered to participate in park management?

- Park should provide facilitations to the RUCs e.g. stationery, rain gear and gumboots
- Park should allow resource users harvest more forest plants after offtake data analysis say so
- Park and ITFC should give regular feedback on the offtake data collected and analysed
- Park and NGOs should build an office/multi-purpose hall for RU operations and meetings
- Park should give special consideration for resource users to benefit from the revenue sharing
- UWA's law enforcement department should provide airtime for reporting illegal activities
- R&M department should pay resource users a day allowance on the days of monitoring
- Park should support RU savings schemes using the gorilla levy and revenue sharing funds
- Park should allow resource users track gorillas as an incentive
- Park and ITFC should organise learning workshops and seminars for resource users
- Park should train and equip selected resource users as local community forest guards

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Other recommendations include:

- MoUs should be reviewed as soon as possible given that mid-term reviews are long overdue
- Resource users should be involved in determining harvest quotas using off-take results
- Improve data collection, analysis and feedback
- CCRs should help resource users in correcting mistakes when recording off-take data
- The data sheets for recording off-take data should be simplified and made clearer
- Revise the bundles, handfuls and head-loads used in quantifying off-takes
- CCRs should meet with resource users at least 4 times a year

- Quarterly reports from the off-take data collected should be produced regularly and shared as a feedback mechanism
- ITFC should involve park staff especially CCRs in PSP assessments
- ITFC and other researchers should share findings of scientific studies on the status of PA resources
- Multiple use areas should be re-zoned especially where tourism is booming
- Resource users who have been arrested for poaching should be removed from the MU program
- Park should re-visit the list of plant species which are allowed for harvesting since many species were left out of the current MoUs and yet they are considered important by resource users
- Park should allow resource users access to other PA resources such as fish, firewood, mushrooms, wild honey and old boundary trees
- Park should allow resource users more access to bamboo rhizomes and forest seedlings for on-farm cultivation in the communities
- Park staff and resource users should have regular meetings to communicate better to each other issues of resource harvest and illegal activities in harvest zones
- Park should promote sustainable harvest methods through conservation education programmes
- Park should support exchange visits among RU groups locally, nationally and in the region so that they can improve their leadership skills and quality of products as well as find market
- Park should support RU savings schemes using money from the revenue sharing program
- ITFC and park should involve resource users in resource assessments to determine what can be allowed for harvesting
- Park should take action when resource users report illegal activities in harvest zones
- Park should give regular feedback from the offtake data
- Park, researchers and resource users should have joint meetings to share information about resource harvest impacts and how to manage the challenges

- Resource users should be represented on park committees handling community interventions like revenue sharing so that they can participate in park's decision-making processes
- Park should involve resource users in problem animal management especially when it comes to guarding against crop raiders
- Park should consider resource users for goats given under the revenue sharing program
- All stakeholders should have joint monitoring activities
- Finally, there is need to develop a simple tool for monitoring offtake harvesting inside the park

6.5 Recommended local community plant harvest monitoring method

During the PRA exercises above, ITFC made brief presentations on a method of subjective focussed searches that was used for comparisons with a random plot method (for plant abundance assessment) in the MUZs. Particular emphasis was made on the reliability of both approaches in assessing plant abundances. ITFC described the simple procedures involved in focused searches whereby the observer(s) while walking in multiple use zones records the status of the plants based on visual stem abundances. Focused searches employ a simple system of scoring plant abundances based on what one can see and count. Plants are recorded as 'abundant' if more than ten plant stems of a species are counted, 'not abundant' if less than ten stems are counted and 'absent' if no single plant stem is observed. This method was used previously alongside the random sample plots by ITFC while assessing plant resource abundance in the MUZs. The method did not differ significantly in assessing abundance of resource plants from the random sample plots established by ITFC. After the presentations, resource users were asked if they considered subjective focused searches simple and participatory and thus suitable for the new monitoring arrangement. Animated discussions were encouraged with a view of finding other alternative methods that could be used by resource users in monitoring plant harvest

impacts and whether this method could be used by them to monitor plant harvest impacts. In all PRAs, it turned out that the majority of resource users were in favour of using focused searches with slight modifications and as such it was deemed unnecessary to explore alternative methods. As a way forward, resource users asked ITFC together with UWA to train them in using the subjective focused searches method since they found it easy to learn and apply in the forest. They also requested for facilitation in terms of tools for data collection, forest gear and monitoring allowances. A simple monitoring tool to be used by resource users was therefore designed by ITFC to facilitate the RUCs in monitoring plant harvest impacts (see attached appendix).

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8.0 Appendix 1

9 A simple monitoring tool for local community use in Bwindi's Multiple Use Zones

9.1 Introduction

A simple tool for monitoring the status of multiple use zones by local people in Bwindi Impenetrable National Park was developed by the Institute of Tropical Forest Conservation (ITFC) together with the Uganda Wildlife Authority (UWA) with funds from the Bwindi Mgahinga Conservation Trust (BMCT). Seven forest resource user societies in the parishes of Karangara, Rutugunda, Southern ward, Mushanje, Nyamabare, Kashasha and Mpungu sub-county (Muramba, Buremba) were involved in developing the monitoring tool with a view to engaging the local people in both data collection and analysis in a bottom-up approach. A participatory approach which involved face-to-face interviews, participatory rural appraisals (PRAs) and forest visits was used to seek local people's views in developing the simple local community monitoring scheme.

Availability of potentially harvestable forest resources in Bwindi's Multiple Use Zones (MUZs) will be monitored using a simple method of subjective focused searches. This was also agreed upon by RUCs and resource users during interviews, PRAs and field trials. Local community monitors were trained in searching for and recording the abundance of potentially harvestable forest resources using subjective focused searches during field trials. In this regard, forest resources in MUZs will be considered abundant if 10 or more stems of a harvestable plant are encountered during forest walks, also the plants will be considered rare if less than 10 stems of a harvestable plant are encountered and not found if the monitors do not encounter any stem of a harvestable plant (see data sheet for use in appendix 2). Note that the harvestable class varies

among species as some forest resources become harvestable when in flower (e.g. *Setaria plicatilis* and *Sericostachys scandens*) or when they are large enough to produce substantial bark for harvesting (e.g. *Ocotea usambarensis* and *Rytigynia kigeziensis*).

9.2 Who will be involved?

➢ The monitoring will be done on a seasonal basis by a group of five resource users who will be selected by RUCs in each parish.

➢ Each local community monitoring group (LCMG) will be composed of the of the RUC chairperson, RUC secretary, a representative of basket makers, a representative of herbalists and a representative of the Batwa (where applicable).

➢ The monitoring scheme will also involve park staff (CCRs) who will participate as observers.

9.3 Data collection

9.3.1 Subjective focused searches

➢ Prior to visiting the forest, the monitors should hold a brief meeting and draw up a plan for the forest walk which should traverse the areas inside MUZs where potentially harvestable resources are known to occur.

➢ The secretary should write the names of plant resources which will be monitored on the monitoring form.

➢ On reaching the park boundary, the secretary should record the time when they have entered the forest.

➢ At the start and throughout the forest searches, the RUC chairman should ensure that each monitor searches for and records the resources and disturbance data with the secretary.

➢ The secretary should keep tallying every time a given plant name is sighted and mentioned by the monitoring group.

➢ At intervals of about 30 minutes, the monitors should check with the secretary and keep track of the data being recorded.

- When the monitors feel that they have adequately searched for the resources on their list, they should agree to end the search and return to the community.
- While at the park boundary as they exit the forest, the secretary should record the time of exit.
- When they get back to the community, the monitoring group should go through their data and make sure that the data collected was well recorded.
- The secretary should then transfer the data from the monitoring forms into a logbook for more archiving purposes and secure data storage.

9.3.2 Perception interviews

- Perception interviews will be carried out at the time of recording off-takes after harvests.
- Ten interviews of 5 men and 5 women will be carried out by the RUC chairman and secretary.
- The data will be recorded by the secretary in easy-to-complete data sheets and later transferred to the logbook for archiving purposes and secure data storage.
- A copy of the data collected during forest walks and perception interviews should be given to the CCR. This data will enable park management to monitor the level of resource use and the general state of the MUZs.

9.4 Analysing and using the data by local communities

The resource users should meet before the start of the harvesting season to discuss the data collected by the LCMGs. In the meetings, the LCMGs should present their findings and help explain to resource users the extent of resource availability, level of resource abundance, illegal activities encountered and resources that are decreasing or have become scarce. This will help inform resource users in choosing local areas and forest resources for the next harvest.

9.5 Analysing and using the data by park managers

After receiving the monitoring forms, park managers should analyse the data and use the results as a basis for discussing with resource users management actions which can stop further decrease of the affected forest resources or increase the availability of the resources that are scarce. During the discussions, park managers should also tackle the following issues: frequency of forest walks, number of interviews, status of and trends in availability of forest resources, large mammal activity and illegal activities.

9.6 Frequency of monitoring

During field trials and PRAs, the resource users and RUCs agreed to carry out the monitoring during harvest seasons. This means that forest walks in MUZs and the perception interviews will be carried out at least twice a year.

9.7 How to motivate local community monitors

In this scheme, the local community monitors will be volunteers working for free with the only motivation being that of collaboration for the conservation and management of MUZs as stipulated in the collaborative management agreement. However, to help maintain motivation, it will be necessary for park authorities to empower local communities by for instance allowing them to set and regulate off-take quotas based on their data and facilitating them to share their findings during cross-site visits among forest societies.

9.8 Conclusion

This monitoring tool was developed in a participatory manner and thus includes views from resource user groups and park managers. It is therefore recommended for use by local communities for monitoring forest resources in Bwindi's multiple use zones.

Appendix 2

Monitoring form 1: Field data sheet for monitoring the status of resources

Date (*ebiro byokwezi*): ....

Name of recorder (*owahandiika*): ....

Parish (*omuruka gwanyu*): ....

Local area name in MUZ (*ahumwachondoza*): ....

Time taken for forest walk (*mwamara bwiire ki omwihamba*): ....

Local plant name (*Eiziina ryekirasharurwa*)	Tally *(Kozesa obuti kugiita ebimwareba)*	Total number (*Giita obuti bumwakozesa*)	Abundance (*Obwingi bwebirasharurwa*)

Abundance: 2 = 10 and more "common" (*bikanyire*), 1 = less than 10 "rare" (*nibikye*) and 0 = "Not found" (*tibiriyo*)

A checklist of disturbance indicators *(please mark with a cross in the box provided)*

Snares *haine emitego yimwareba mwihamba?*: Yes *Eego*   ☒ / No *Ngaaha* ☐
Burning *haine ahu bokize mwihamba?*: Yes *Eego*   ☐ / No *Ngaaha* ☒
Pole cutting *haine emiti mito yibatemire mwihamba*?: Yes *Eego*   ☐ / No *Ngaaha* ☒
Cutting big trees *haine emiti mihango yibatemire mwihamba*?: Yes *Eego*   ☒ / No *Ngaaha* ☐
Large mammals seen *haine enymaishwa zimwareba mwihamba*?: Yes *Eego*   ☒ / No *Ngaaha* ☐
Signs of large mammals *haine obumanyiso bwenymaishwa bumwareba mwihamba*?: Yes *Eego* ☐ / No *Ngaaha*

Poles cutting (*Handiika amaziina nemibaaro g'emiti mito etemiwre)*

....

Big trees cutting (*Handiika amaziina nemibaaro g'emiti mihango etemiwre)*

....

Large mammals seen (*Handiika amaziina nemibaaro g'enyamaishwa ezimwareeba)*

....

Signs of large mammals (*Handiika amaziina g'enyamaishwa ezimwareeba obumanyiso bwazo*...

Monitoring form 2: Perception interview guide (for 5 women and 5 men after harvest)

Date (*ebiro byokwezi*): ....

Name of recorder (*owahandiika*): ....

Name of resource collector (*owasharura*)..

Parish (*omuruka gwanyu*): ....

  i.   Did you find any snares in the park? *Hiine emitego yimwareba omwihamba?* Yes *Eego*☐

        No *Ngaaha* ☐

 ii.   How many snare did you find? Emitego nengahi………………….

iii.   Were there any burnt sites in the park? *Hiine ahu bokize omwihamba?* Yes *Eego* ☐   No

        Ngaaha ☐

iv.   How many burnt sites did you see (Ahahire nihangahi)?.....................

 v.   Were there any cut trees in the park? *Hiine emiti yibatemire omwihamba*? Yes *Eego* ☐

        No *Ngaaha* ☐

vi.   How many cut trees? Emiti etemire nengahi?..

vii.   Did you see any large mammals or their sign in the MUZ? *Hiine enyamaishwa ninga obumanyiso bwazo buwareba omwihamba*? Yes *Eego* ☐   No *Ngaaha* ☐

    If yes, name them: *Niziiha kandi nizingaki?*

    ....

viii.   What have you collected this season? For each item, how long has it taken you to collect the resource? (Less than ½ hour, ½ hour, 1 hr, 2 hrs, 3 hrs, more than 3 hours). *Handiika amaziina g'ebiwasharuura nobwiire buwatwara omukubisharuura (Torana omuri ebi: tikyahika kicweka kyeshaaha, kyatwara ekicweka kyeshaaha, eshaaha emwe, eshaaha ibiri, eshaaha ishatu, harenga eshaaha ishatu)*

    1: *eiziina ryekiwasharura* ………………………… *kyakutwarira bwiire ki?* …………………………..

    2: *eiziina ryekiwasharura* ………………………… *kyakutwarira bwiire ki?* …………………………..

    3: *eiziina ryekiwasharura* ………………………… *kyakutwarira bwiire ki?* …………………………..

    4: *eiziina ryekiwasharura* ………………………… *kyakutwarira bwiire ki?* …………………………..

5: *eiziina ryekiwasharura* …………………………*kyakutwarira bwiire ki?* …………………

ix.   Any other thing to report? Ebindi

byokongyeraho?..

....

Thank you (*Webare munonga*)

Appendix 3

Questionnaire used during interviews with RUC members and park staff

Date: _____Parish_____

Name: _____

Status (**Chairman RUC, Secretary RUC, CAM, CCW, R & MW, CCR**)_____

1. Are you aware of the MUP plant harvest monitoring system? (PSPs, local community offtake recording) (Y/N)
2. If yes which one(s) are you aware of?
3. Which type do you participate in?
4. List the strengths of the current system of plant harvest impact monitoring if any?
5. List the weaknesses/problems of the current plant harvest impact monitoring systems
6. How can the above weaknesses be addressed?
7. What problems do you encounter during the current local community plant offtake recording (**for RUC**)/ data analysis (**for PA managers**)
8. How can the problems be solved?
9. How have you been motivated participating in the current system of resource harvesting? (Probe whether the resources got from the park are considered a form of motivation; what other forms of motivation are considered important?).
10. As park managers, are you motivated in doing the analysis? Do you think that harvesting resources is in itself motivation for the harvesters to participate in monitoring MUP plant harvest?
11. Do you get/give feedback of the local community forest offtake recording (***RUC/PA manager-where applicable***) (Y/N). How often in a year?
12. How can the RUC/PA manager be motivated to participate effectively (with roles and responsibilities fulfilled)?
13. How would you like the data/ results finally used? (Plant offtake harvest quota increased/decreased or kept the same)?

14. Suggest how the current monitoring system can be improved (recommendations for improving the current monitoring system)

Issues discussed during PRA

1. Roles responsibilities of different stakeholders in the MUP

2. How can local communities (RU groups) be involved in plant harvest monitoring?

3. How can resource user groups be empowered to participate in plant harvest monitoring

4. ITFC's two methods of assessing plant abundance in BINP (Subjective focused searches and random plot methods)

5. Any lessons from ITFCs two methods for a local community monitoring tool?

6. How should the analyzed data be used by the local communities and UWA in adjusting annual forest resource offtake quotas?

7. Analyzed results from plant off-takes recorded by the different forest resource user groups of BINP

8. Strengths/weaknesses/problems with forest resource offtake recording

9. Who should be recording forest resource off-takes?

10. Who should be keeping the records?

11. Who should be analyzing the data?

12. Any motivation/incentive issues in stakeholders knowing and accepting their roles and responsibilities in the MU monitoring programme?